REMARKS

Claims 1-9 are all the claims pending in the application. Claims 10 and 11 have been newly added. Applicants thank the Examiner for acknowledging Applicants' claim for foreign priority and receipt of the certified priority document, JP 2002-237579. Applicants also thank the Examiner for considering the references submitted with the August 18, 2003 Information Disclosure Statement.

Objection to the Drawings:

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because the grounds of objection indicate that items 25 and 26 shown in Figure 4 are not mentioned in the description. Applicants have amended the specification herein to indicate that items 25 and 26 are electrode clamps as understood from Figure 4 itself, as well as the description of clamp section 25a described at page 8, lines 19-21 of the present specification. No new matter has been added.

Objection to the Specification:

The grounds of objection state that the title of the invention is not descriptive, and require a new title. Applicants have amended the title to read --Method for Manufacturing Discharge Tube Using Heat for Oxidation of Adhesion Area of Electrode Lead--.

Also objected to are some phrases used in the specification. In particular, the examples provided include on page 2 line 26, the phrase "Although above advantages"; and on page 3 lines

13-14 the sentence, "For a lens-fitted photo film unit with flash unit, a considerable low cost is required."

Applicants have amended the specification to more clearly define these particular phrases. Applicants also respectfully refer the Examiner to the guidance in MPEP 608.01(g) that it must be remembered that an examination is not made for the purpose of securing grammatical perfection, and submit that the cited phrases would be understood by one of ordinary skill in the art in the context of the present specification. Indeed, Applicants respectfully submit that the stated purposes of the first paragraph of 35 U.S.C. §112 are to clearly convey the information that an Applicant has invented the subject matter which is claimed, and to put the public in possession of what the Applicant claims as the invention.[1] Accordingly, Applicants believe that the present specification meets 35 U.S.C. § 112, first paragraph requirements.

Claim Objections:

Claim 9 is objected to because the phrase "alternative current." Applicants have amended claim 9 to indicate that this term is --alternating current--, as understood by the Examiner.

Claim Rejections - 35 USC § 103

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Harushige (JP 08-236023) in view of Nakamura et al. (U.S. Patent No. 6,000,982) and Sakamoto (U.S. Patent No. 4,103,416). The grounds of rejection state that Harushige discloses a discharge bulb

having a glass tube (1; paragraph 2), a glass bead (6; paragraphs 14-16) for sealing an end of said glass tube (paragraph 14), and an electrode lead (2b; paragraph 14) to be fixed to said glass bead (6). The grounds of rejection further state that the oxidation feature of claim 1 is shown in paragraph 14, and that fixing said glass bead to said adhesion area of said electrode lead is taught in paragraphs 14-15.

The grounds of rejection acknowledge that Harushige is silent regarding the limitations that a rare gas is put into the glass tube, and the heat application device oxidizes only a surface of a predetermined adhesion area. To make up for this feature, the grounds of rejection state that Nakamura et al. teach the use of a rare gas in a discharge tube (citing column 1, lines 29-36) in order to increase the life to the discharge tube. Further, the grounds of rejection acknowledge that both Nakamura et al. and Harushige are silent regarding the limitation that the heat application device oxidizes only a surface of a predetermined adhesion area. The grounds of rejection allege that this feature is taught by Sakamoto, and that the motivation for combining Sakamoto with Nakamura et al. and Harushige would be to improve the electrical connection of the device. Applicants respectfully traverse this rejection.

First, the claims of the present invention relate to a method for manufacturing a discharge tube. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977

[1] The Examiner is kindly referred to section 2163 of the MPEP for a discussion of case law related to the purpose of 35 U.S.C. § 112, first paragraph.

F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). *See also In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); In re Clay, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992). In this case, Sakamoto relates to the entirely different field of electrical terminals. Additionally, Sakamoto relates to providing a seal between the lead wire and the terminal using a fused glass bead as an insulator. On the other hand, the glass bead in the present invention is used in conjunction with the discharge tube's glass tube to seal a rare gas. Thus, Applicants respectfully submit that Sakamoto is neither in the field of Applicants' endeavor nor reasonably pertinent to sealing a rare gas in a discharge bulb.

Secondly, while Sakamoto mentions oxidizing an intermediate portion of a lead wire to provide a chromium oxide layer on the lead wire, Sakamoto teaches away from the feature of claim 1 of oxidizing "*only a surface of a predetermined adhesion area* of said electrode lead." In Sakamoto, oxide layers on the exposed surfaces of the support cup and on the lead wire are required to be removed in a reducing atmosphere (see Abstract and col. 5, lines 43-50).

Further, in order to carry out the selective oxidation, Sakamoto attaches the resist layer 24 on an intermediate portion 22, which is to be oxidized (see col. 4, lines 47-51 and Figure 3), next plating the lead-in wire 20 then, the resist layer is removed (see col. 5, lines 7-10). On the other hand, the present invention carries out the selective oxidation without using any resist materials. Accordingly, for the aforementioned reasons, Applicants respectfully submit that claim 1 is allowable. Claims 2-9 are allowable at least based on their dependency on claim 1, as well as for their own features, as discussed below.

Claims 2-4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Harushige in view of Nakamura et al. and Sakamoto, and further in view of Kudo et al. (U.S. Patent No. 6,531,811). The grounds of rejection acknowledge that the combination of Harushige, Nakamura et al., and Sakamoto all fail to teach the use of electrode members and a power source that applies a predetermined voltage between the pair of electrode members to heat the adhesion area, and that the degree of oxidation of the adhesion area is adjusted by changing the voltage, the electric current, the energizing period of said power source, or a combination thereof as recited in claim 2. Yet, the grounds of rejection allege that this feature is taught by Kudo et al., citing a pair of pair of electrode members (4; Figure 1; column 1, lines 25-40) and a power source (Figure 4) that applies a predetermined voltage (Figure 4) between said pair of electrode members to heat said adhesion area (column 7 lines 27-33). The grounds of rejection state that a degree of heating is adjusted by changing the voltage, the electric current, the energizing period of said power source, or a combination thereof (citing column 7, lines 27-33) in order to better heat an electrode. Therefore, the grounds of rejection conclude that it would have been obvious at the time of the invention to one of ordinary skill in the art to combine the method of manufacturing a discharge tube as taught by Harushige, Nakamura et al. and Sakamoto with the heating device of Kudo et al. in order to better heat the electrode. Applicants respectfully traverse this rejection.

First, Kudo et al. discloses a liquid metal ion source, and is not even remotely related to oxidation of an electrode. Rather, Kudo et al. relates to heating a liquid metal ion source used for manufacturing a semiconductor circuit (see col. 1, lines 15-23). Secondly, Kudo et al. does

not disclose a pair of electrodes, as claimed. Rather, Kudo et al. discloses a needle electrode 1 (see col. 1, line 26, and Figure 1). Further, the oxidation process of Sakamoto is carried out at a treatment of the lead conductor in a hydrogen atmosphere, to minimize plating errors (see col. 5, lines 12-18). As mentioned above, Kudo et al. does not disclose an oxidation process, and therefore its substitution for the oxidation device of Sakamoto would not be technically feasible. Finally, Kudo et al. at column 7, lines 27-33 as cited in the grounds of rejection relates to determining the flashing interval of an extractor, by application of current to the heater and voltage to the extractor. This flashing process is completely different, and would not suggest adjusting the degree of oxidation of an adhesion area by changing the voltage, the electric current, the energizing period of said power source, or a combination thereof of the heat application device (or the heater in Kudo et al.). Therefore, claim 2 is allowable for these reasons as well as its dependency on claim 1.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Harushige in view of Nakamura et al. and Sakamoto, and further in view of Horiuchi et al. (U.S. Patent No. 6,791,271). The grounds of rejection acknowledge that the combination of Harushige, Nakamura et al., and Sakamoto all fail to teach the use of a laser device that irradiates laser light to said adhesion area of said electrode lead. Yet, the grounds of rejection state that this feature is taught by Horiuchi et al., citing a laser to heat an electrode that is adhered to a glass tube (column 15 lines 24-37) in order to increase the life of the discharge tube (column 4 lines 15-29). Applicants respectfully traverse this rejection. The method of claim 5 uses a laser device as the heat application device for oxidation purposes. On the other hand, Horiuchi et al. is silent with

respect to oxidation, and the laser is used for an entirely different purpose for heating quartz glass tube 67 so that the quartz glass tube 67 shrinks around the electrode because of the pressure difference between the inside and outside of the quartz glass tube 67 (see col. 15, lines 12-23). Because of the use of the laser in Horiuchi et al. for an entirely different purpose, one of ordinary skill in the art would not look to Horiuchi et al. for the purposes of its laser for oxidation of an electrode. Accordingly, Applicants respectfully submit that claim 5 is allowable for this reason, as well as its dependency on claim 1.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Harushige in view of Nakamura et al., and Sakamoto, and further in view of Bundo et al. (U.S. Patent No. 6,354,901). The grounds of rejection acknowledge that the combination of Harushige, Nakamura et al., and Sakamoto all fail to teach the use of an infrared light device that irradiates infrared light to said adhesion area of said electrode lead. The grounds of rejection state that this feature is shown by Bundo et al. by an infrared light device that irradiates infrared light to said adhesion area of said electrode lead (citing column 9, lines 16-30; column 8 line 44-63) in order form a more effectively heat the electrode. Applicants respectfully traverse this rejection.

The method of claim 6 uses a infrared light device as the heat application device for oxidation purposes. On the other hand, Bundo et al. is silent with respect to oxidation, and its infrared device is used for the entirely different purpose of irradiating a glass ring (not shown) to form the sealing glass 16a (see col. 9, lines 19-30). Because of the use of the irradiation device in Bundo et al. for an entirely different purpose, one of ordinary skill in the art would not look to Bundo et al. for the purposes of use of an infrared light device for oxidation of an electrode.

Accordingly, Applicants respectfully submit that claim 6 is allowable for this reason, as well as its dependency on claim 1.

Claims 7 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Harushige in view of Nakamura et al., and Sakamoto, and further in view of Monneraye et al. (U.S. Patent No. 4,163,656). The grounds of rejection acknowledge that the combination of Harushige, Nakamura et al., and Sakamoto all fail to teach the use a ring-shaped ceramic heater with a hole to insert said electrode lead. The grounds of rejection allege that this feature is taught by Monneraye et al., citing a ring-shaped ceramic heater as a heat application device (3; Figure 1a; column 2 lines 60-63; column 3 lines 5-15) that contains a hole (2) into which the electrode (1) is inserted.

Applicants note that item 3 as cited by the grounds of rejection is not a ceramic heater. Rather, item 3 is a ceramic component that is part of, for example, a photomultiplier tube. Instead, a furnace is used for heating in Monneraye et al. (see col. 3, lines 5-15). Further, the grounds of rejection state that while Monneraye et al. is silent with respect to item 3 being a heater, that when the ceramic is put into the "heater" (furnace), that the ceramic item 3 would conduct heat from the furnace onto the electrode lead. Applicants respectfully submit that this teaching and scenario provided by the grounds of rejection is far removed from the ring-shaped ceramic heater as claimed which is used for oxidation purposes of an electrode. The furnace of Monneraye et al. is not used, nor would suggest an oxidation process, but rather a sealing process. Accordingly, Applicants respectfully submit that claims 7 and 8 are allowable for this reason, as well as their dependency on claim 1.

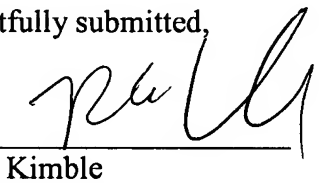
Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Harushige in view of Nakamura et al., and Sakamoto, and further in view of Palmer et al. (U.S. Patent No. 4,271,345). The grounds of rejection acknowledge that the combination of Harushige, Nakamura et al., and Sakamoto all fail to teach the use a high frequency induction heating device that is composed of a coil section that covers said adhesion area without contacting said electrode lead and a high frequency power source section that generates alternative current with high frequency to said coil section. Rather, the grounds of rejection state that this feature is taught by Palmer et al. where a high frequency induction heating device that is composed of a coil section (citing item 32; Figure 2a; column 2 lines 51-65) that covers the adhesion area without contacting the electrode lead (38) and a high frequency power source section (citing column 2 lines 51-60) that generates alternating current with high frequency to said coil section (citing the Abstract). Applicants respectfully traverse this rejection.

First, Palmer et al. is related to heating a mask support pin in a confined space of the corner of a television panel skirt. Thus, Applicants respectfully submit that it is not analogous art. Secondly, heating of a support pin in the corner portion of a television panel skirt would not suggest the oxidation process as recited in claims 1/9. Accordingly, Applicants respectfully submit that claim 9 is allowable for this reason, as well as its dependency on claim 1.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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